

CLAIMS

What is claimed is:

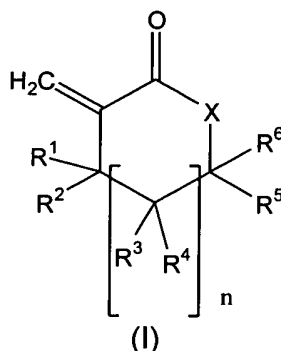
1. A composition comprising,

(a) an  $\alpha$ -methylene lact(one)(am) copolymer comprising,

- 5 (i) at least one  $\alpha$ -methylene lact(one)(am) monomer of Formula I, and  
(ii) at least one other free radically copolymerizable monomer, and

(b) a filler,

10 provided that no more than 95 mole percent and not less than 1 mole percent of repeat units in said  $\alpha$ -methylene lact(one)(am) copolymer are derived from said  $\alpha$ -methylene lact(one)(am) monomer,



15 wherein:

n is 0, 1 or 2;

X is  $-O-$  or  $-NR^9-$ ; and

20 R<sup>1</sup>, R<sup>2</sup>, R<sup>5</sup>, R<sup>6</sup>, each of R<sup>3</sup> and each of R<sup>4</sup>, are independently hydrogen, a functional group, hydrocarbyl or substituted hydrocarbyl, and R<sup>9</sup> is a hydrocarbyl or a substituted hydrocarbyl.

2. A composition comprising an  $\alpha$ -methylene lact(one)(am) homopolymer, and from 5% to 80% by weight of a filler, based on the total weight of said homopolymer and said filler.

25 3. A composition comprising the  $\alpha$ -methylene lact(one)(am) copolymer of Claim 1 and from 5% to 80% by weight of a filler, based on the total weight of said copolymer and said filler.

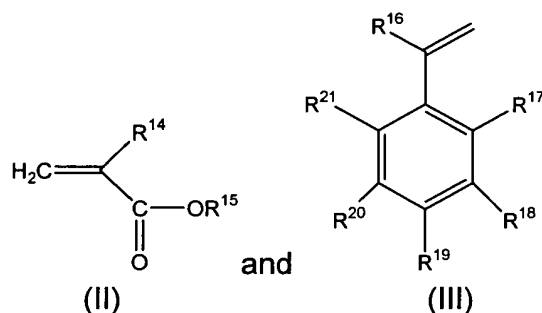
30 4. A composition comprising an  $\alpha$ -methylene lact(one)(am) homopolymer and at least 10% by weight of alumina trihydrate based on the total weight of said homopolymer and said alumina trihydrate.

5. A composition comprising the  $\alpha$ -methylene lact(ane)(am) copolymer of Claim 1 and at least 10% by weight of alumina trihydrate based on the total weight of said copolymer and said alumina trihydrate.

6. The composition as recited in Claim 1 wherein  $R^1$ ,  $R^2$ ,  $R^3$ ,  $R^4$ ,  $R^5$  and  $R^6$  are all independently hydrogen or alkyl containing 1 to 6 carbon atoms, and X is oxygen.

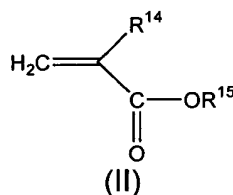
7. The composition as recited in Claim 1 wherein n is 0.

8. The composition as recited in Claim 1 wherein the free radically copolymerizable monomer comprises at least one of acrylonitrile, methacrylic acid, compounds of Formula II and compounds of Formula III,



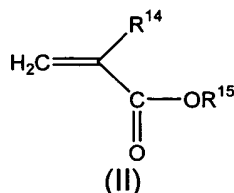
wherein  $R^{14}$  is hydrogen or methyl,  $R^{15}$  is hydrocarbyl or substituted hydrocarbyl, and  $R^{16}$  is hydrogen or methyl, and  $R^{17}$ ,  $R^{18}$ ,  $R^{19}$ ,  $R^{20}$  and  $R^{21}$  are each independently hydrogen, hydrocarbyl substituted hydrocarbyl or a functional group.

9. The composition as recited in Claim 3 wherein the free radically copolymerizable monomer of Claim 1 is the compound of Formula II,



wherein  $R^{14}$  is hydrogen or methyl, and  $R^{15}$  is hydrocarbyl or substituted hydrocarbyl.

10. The composition as recited in Claim 5 wherein the free radically copolymerizable monomer is the compound of Formula II,



wherein R<sup>14</sup> is hydrogen or methyl, and R<sup>15</sup> is hydrocarbyl or substituted hydrocarbyl.

11. A composition comprising, at least one α-methylene lact(one)(am), a free radically copolymerizable monomer, an inorganic filler, and optionally a free radical initiator.

12. The composition of Claim 1 wherein the copolymer is crosslinked.

13. The composition of Claim 2 wherein the homopolymer is crosslinked.

14. The composition of Claim 3 wherein the copolymer is crosslinked.

15. 15. The composition of Claim 4 wherein the homopolymer is crosslinked.

16. The composition of Claim 5 wherein the copolymer is crosslinked.

17. The composition of Claim 11 wherein the copolymer is crosslinked.

18. The composition of Claim 1 in the form of a sheet or a molded article.

19. The composition of Claim 2 in the form of a sheet or a molded article.

20. 20. The composition of Claim 3 in the form of a sheet or a molded article.

21. The composition of Claim 4 in the form of a sheet or a molded article.

22. The composition of Claim 5 in the form of a sheet or a molded article.

23. The composition of Claim 11 in the form of a sheet or a molded article.

24. The composition of Claim 1 in the form of a solid surface material used as a decorative surface.

25. 25. The composition of Claim 2 in the form of a solid surface material used as a decorative surface.

26. The composition of Claim 3 in the form of a solid surface material used as a decorative surface.

27. The composition of Claim 4 in the form of a solid surface material used as a decorative surface.

5 28. The composition of Claim 5 in the form of a solid surface material used as a decorative surface.

29. The composition of Claim 11 in the form of a solid surface material used as a decorative surface.

10 30. The composition of Claim 1 in the form of a kitchen top, counter top, table top, bathroom counter top, a wall covering, a kitchen sink, a bathroom sink, or a bathtub.

31. The composition of Claim 2 in the form of a kitchen top, counter top, table top, bathroom counter top, a wall covering, a kitchen sink, a bathroom sink, or a bathtub.

15 32. The composition of Claim 3 in the form of a kitchen top, counter top, table top, bathroom counter top, a wall covering, a kitchen sink, a bathroom sink, or a bathtub.

20 33. The composition of Claim 4 in the form of a kitchen top, counter top, table top, bathroom counter top, a wall covering, a kitchen sink, a bathroom sink, or a bathtub.

34. The composition of Claim 5 in the form of a kitchen top, counter top, table top, bathroom counter top, a wall covering, a kitchen sink, a bathroom sink, or a bathtub.

25 35. The composition of Claim 11 in the form of a kitchen top, counter top, table top, bathroom counter top, a wall covering, a kitchen sink, a bathroom sink, or a bathtub.

36. A solid surface material exhibiting antimicrobial effectiveness, the solid surface material comprising the composition of Claim 1.

30 37. A solid surface material exhibiting antimicrobial effectiveness, the solid surface material comprising the composition of Claim 2.

38. A solid surface material exhibiting antimicrobial effectiveness, the solid surface material comprising the composition of Claim 3.

39. A solid surface material exhibiting antimicrobial effectiveness, the solid surface material comprising the composition of Claim 4.

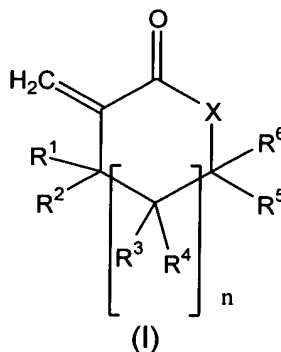
35 40. A solid surface material exhibiting antimicrobial effectiveness, the solid surface material comprising the composition of Claim 5.

41. A solid surface material exhibiting antimicrobial effectiveness, the solid surface material comprising the composition of Claim 11.

42. A process for manufacturing a plastic article, comprising the step of contacting

- (a) one or more acrylate or methacrylate esters,
- (b) one or more  $\alpha$ -methylene lact(one)(am) monomers of Formula I,

5



wherein:

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$n$  is 0, 1 or 2;

$X$  is  $-O-$  or  $-NR^9-$ ; and

$R^1$ ,  $R^2$ ,  $R^5$ ,  $R^6$ , each of  $R^3$  and each of  $R^4$ , are independently hydrogen, a functional group, hydrocarbyl or substituted hydrocarbyl, and  $R^9$  is a hydrocarbyl or a substituted hydrocarbyl

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(c) one or more free radical initiators,

(d) at least 10 weight percent of a filler based on total weight of the

said homopolymer or copolymer and the filler,

(e) optionally one or more homopolymers or copolymers of acrylate

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and/or methacrylate esters,

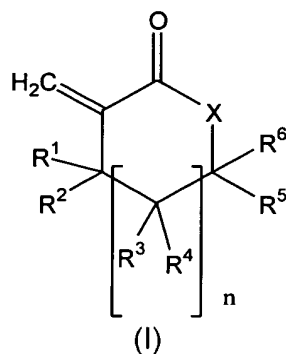
said contacting being at a temperature sufficient to cause said free radical initiator to generate free radicals; and wherein the  $\alpha$ -methylene lact(one)(am) monomer of Formula I is at least 1 mole percent of the total composition of (a) and (b).

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43. A process for manufacturing a plastic article, comprising the step of contacting

- (a) one or more acrylate or methacrylate esters,
- (b) one or more  $\alpha$ -methylene lact(one)(am) monomers of Formula I,

30



wherein:

n is 0, 1 or 2;

5 X is -O- or -NR<sup>9</sup>-; and

R<sup>1</sup>, R<sup>2</sup>, R<sup>5</sup>, R<sup>6</sup>, each of R<sup>3</sup> and each of R<sup>4</sup>, are independently hydrogen, a functional group, hydrocarbyl or substituted hydrocarbyl, and R<sup>9</sup> is a hydrocarbyl or a substituted hydrocarbyl

- (c) at least one free radical initiator
- 10 (d) at least 10 weight percent of alumina trihydrate based on total weight of the said homopolymer or copolymer and alumina trihydrate,
- (e) optionally one or more homopolymers or copolymers of acrylate and/or methacrylate esters,
- 15 said contacting being at a temperature sufficient to cause said free radical initiator to generate free radicals; and wherein the  $\alpha$ -methylene lact(one)(am) monomers of Formula I is at least 1 mole percent of the total composition of (a) and (b).

44. The process of Claim 42, further comprising using the plastic  
20 article as a decorative surface.

45. The process of Claim 43, further comprising using the plastic article as a decorative surface.